IPv6 DNSMasq IPv6 Router Advertisement and DHCP6c settings

IPv6 setup for the router with prefix delegation is a two-step procedure
First you have to get the IPv6 prefix from the upstream router.
The package responsible for this is [Kame's wide-dhcp6]

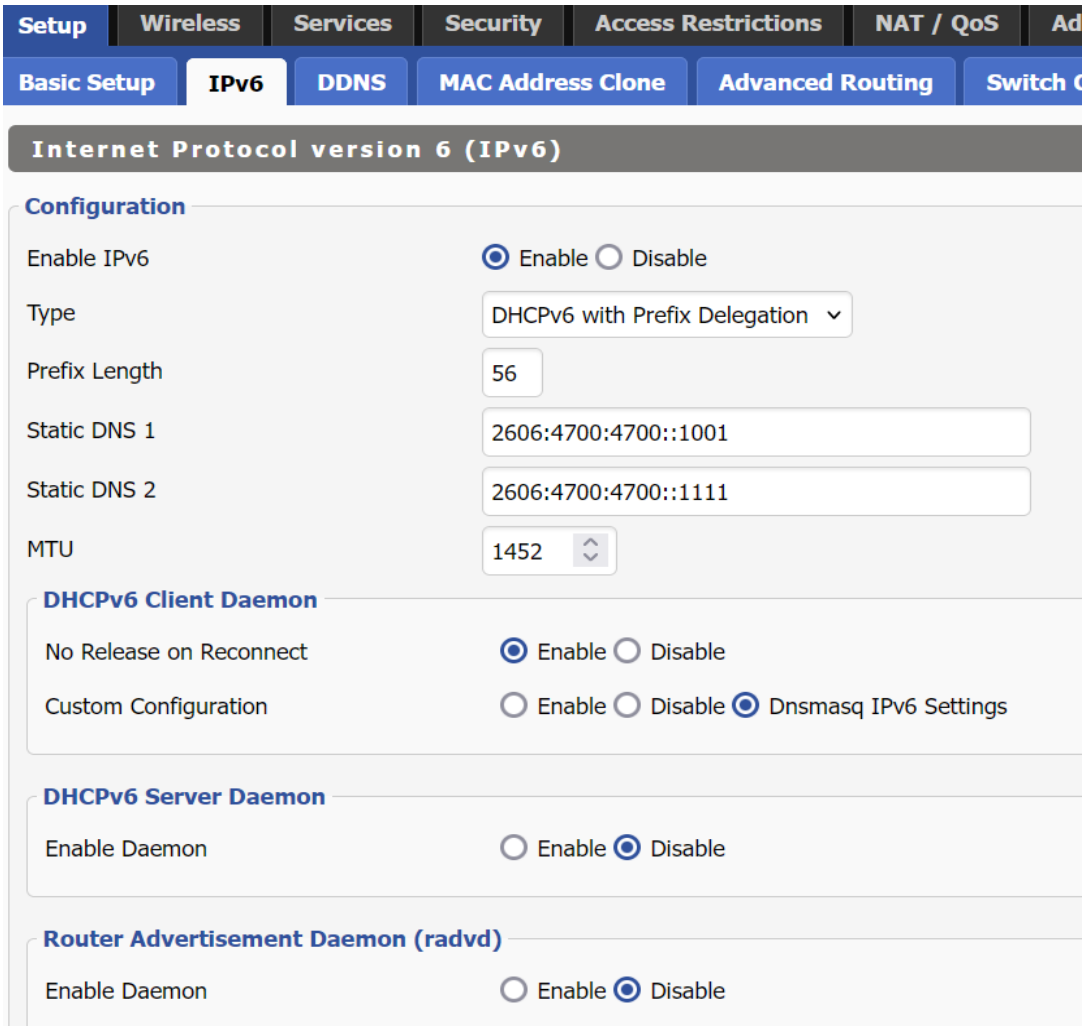
Options see: https://manpages.debian.org/testing/wide-dhcpv6-client/dhcp6c.conf.5.en.html

Note routers with little flash ram (< 8MB) might not have IPv6

STEP 1

Open the DDWRT GUI and go to Setup > IPv6

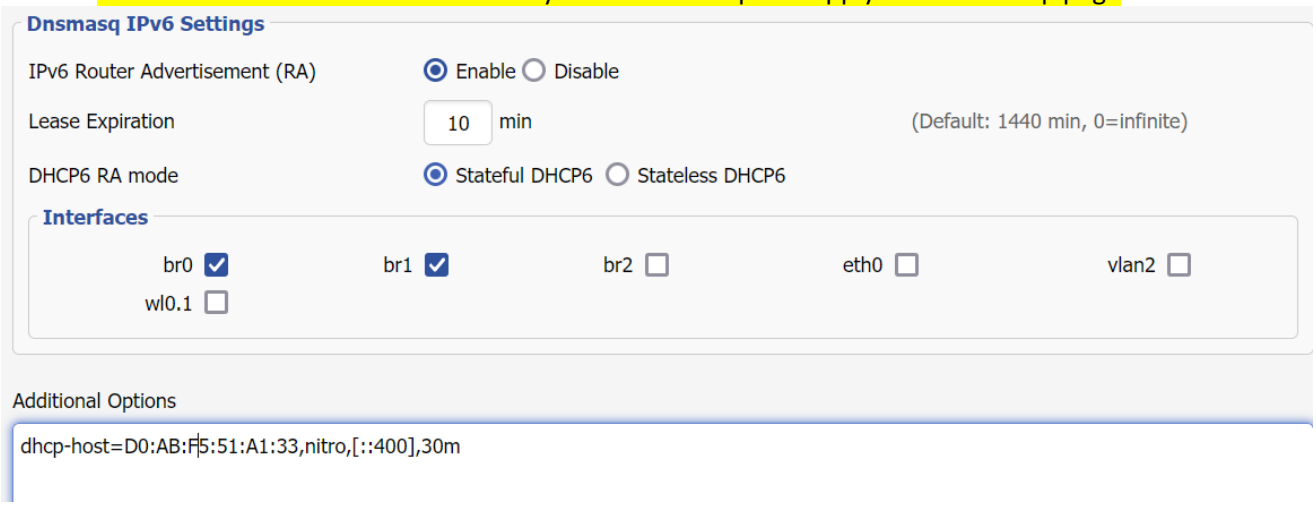
1. Set *Type* : *DHCPv6 with Prefix Delegation*
2. Set *Prefix Length* at the prefix length the ISP or the upstream router will handout, usually 48 or 56.
   If you only got a 64 prefix length delegated, then you can only use one subnet. That is not ideal, there are ways to deal with this (relayd) but this is outside the scope of this guide
3. If desired set IPv6 DNS servers in *Static DNS 1* and *2.*
4. Consider *Enabling No Release on Reconnect* to keep the same prefix.
5. Set *Custom Configuration DNSMasq IPv6 settings* to use DNSMasq settings from step 2.
6. Save and Apply
7. If desired check settings with: *cat /tmp/dhcp6c.conf*
   These settings can function as a blue print if you want custom settings , which can be useful if you want e.g. br0 to have a smaller prefix (=subnet mask) than /64 (e.g. /60), necessary if you want to delegate a prefix to a downstream router via dhcp6 server. You can do this by altering the sla-len.
   The sla-len = desired prefix - Prefix Length. So if the Prefix Length (given by upstream) is 56 and you want a prefix for br0 of 64 it is then the sla-len is 64 -56 = **8**



STEP 2

RADVD can be used to advertise IPv6 settings (Router Advertisement) to your LAN clients but it is rather rudimentary, DNSMasq has much more possibilities and is the preferred way to do this.
So we are using DNSMasq to advertise IPv6 settings to your LAN clients.
Open the DDWRT GUI and go to Services > Services

1. Under DNSMasq IPv6 Settings, *Enable IPv6 Router Advertisement (RA)*
2. Set *Lease Expiration* to your desired value in minutes (minimum is 2, default is 1440 minutes, if you want infinite lease set 0)
3. Choose *DHCP6 RA mode*, *Stateful* or *Stateless*.
   Stateful means both SLAAC and DHCPv6 so that you can set a static IPv6 lease, not all clients support static leases e.g. Android so they will be SLAAC only (strangely enough it translates to DNSMasq option slaac), Stateless means SLAAC only (which translates to DNSMasq ra-stateless).
4. *Check* which *Interfaces* you want to handout IPv6 to your LAN clients.
   (These interfaces will also be used by wide-dhcp6 from step 1 and will automatically get a prefix with length of /64).
5. If desired check final settings with: *cat /tmp/dnsmasq.conf*
6. Make sure to reboot the router after you are done or press Apply on Basic Setup page



For an in depth explanation of DNSMasq options see : https://thekelleys.org.uk/dnsmasq/docs/dnsmasq-man.html)

Static IPv6 lease

Static IPv6 lease, add in DNSMasq additional options:
dhcp-host=D0:AB:F5:51:A1:33,nitro,[::400],30m
This sets an ::400 IPv6 address with a 30 minute lease time, note the brackets around the IPv6 address.

Note: This works only when Stateful DHCP6 is chosen and on OS's which support it so **no Android**

Thanks

Thanks to everyone who tested and made suggestions, especially thanks to @Mile-Lile for his valuable suggestions and test work.

Disclaimer

These are just my personal notes so not very well redacted, take it for what it is worth (rubbish).
I am not in the business of writing guides and wikis so feel free to write a proper IPv6 wiki.
I am also not an expert on IPv6, so do not ask for my help on IPv6 but post your questions in the Advanced networking forum.

References:

https://ipv6int.net/software/wide_dhcpv6.html
https://manpages.debian.org/testing/wide-dhcpv6-client/dhcp6c.conf.5.en.html
https://openwrt.org/docs/guide-user/network/ipv6/dhcp6c
https://sourceforge.net/projects/wide-dhcpv6/
https://thekelleys.org.uk/dnsmasq/docs/dnsmasq-man.html)
https://svn.dd-wrt.com/ticket/4032

To come

Possible things to come in a future upgrade:
RA lifetime: The lifetime of the route which now defaults to 300 sec
DHCP6 Range: start and end of DHCP6 range for stateful addressing (nvram parameters are already present for manual setting: *dnsipv6_range_start* and *dnsipv6_range_end*)
Further down the road *sla-len* per interface